MARINE REVIEW.

VOL. VIII. CLEVELAND, O., AND CHICAGO, ILL., NOV. 9, 1893. No. 19.

On Lake Superior Mining Subjects.

As the importance of the Missabe iron range becomes more apparent with substantial development, vessel owners show an active interest in the operations of the principal companies. John D. Rockefeller is certainly very heavily interested in the syndicate that recently secured control of nearly all the leading properties on the new range, but he is now connected with the American Steel Barge Company more as a creditor—a holder of bonds—than a stockholder. It is remarkable also that the Rockefeller brothers, all three of whom are interested in Lake Superior mines, have placed their investments in different corporations, and in a way that would indicate a difference of opinion among them. Although John D. Rockefeller is the controlling spirit in the Missabe syndicate, and has his agents on the range watching all of the gates to the work of development, William Rockefeller is and has for a long time been a leading stockholder in the Minnesota Iron Company, the syndicate's main opponent, which has also been acquiring mineral land in the new district, and will purchase or lease more of it for the purpose of furnishing business to the Iron Range railway. Mr. Frank Rockefeller, the third brother, who is in charge of Standard oil affairs in Cleveland, has pursued another course in his investments in the mines. He is a half-owner of the Commodore, one of the Missabe mines controlled by Corrigan, Ives & Co. of Cleveland, and only recently became interested with Mr. James Corrigan in the Atlantic, a Gogebic range mine in which it is thought the Iron Belt vein has been struck, and from which one cargo of very good ore was shipped recently. There is no question of the excellent quality of the ore in this new mine, but the quantity is not as yet determined.

Thus the large and promising lands, old and new, in the mining region continue to drift into the hands of big corporations that can furnish the money to keep them up in times of depression, as at present, and be prepared to make immense shipments when conditions warrant such a course. But there has been a great drop in stock values and in everything pertaining to the mines, a shrinkage that could only be met by large and wealthy corporations, as shown by the change that has come over the business. Stock in these mines will be the stock of rich men in the future. The class of moderate investors, who have for years past made occasional trades in iron mining stocks, will find little in these stocks to interest them in the future, even with a return of active shipping seasons. At one time during the recent close money period, Chandler stock sold as low as $22.50 a share, and it would bring little better in open market now, although the company must have a surplus sufficient to pay $30 a share. At the same time there was a sale of the Lake Superior company's stock at $20.

Some of the companies that have money will use it largely for mining during the winter, on account of the low range of wages, which will serve the double purpose of keeping men and mines at work and producing ore at low cost. The directors of the Republic company, at a meeting in Clevelrnd a few days ago, decided on this course, and from the Norrie, Lake Superior and one or two other leading mines on the old ranges there are reports of preparations for some increase in working forces. On the Missabe, however, production according to the present plans will be almost entirely suspended, although the work of stripping surface from some of the new mines will go on in a few cases.

Cadets for the Revenue Marine Service.

By direction of President Cleveland, the latest issue of printed decisions from the treasury department contains revised regulations governing the admission of candidates to the grade of cadet in the revenue cutter service and also a letter prescribing the uniform and outfit with which cadets must provide themselves immediately after receiving their appointments. Candidates must not be less than eighteen nor more than twenty-three years of age. No married man will be appointed a cadet; and the marriage of a cadet will be considered as equivalent to his resignation. Candidates will be required to pass a satisfactory examination as to their physical qualifications before a board of medical officers. They must be of vigorous constitution, physically sound and well formed, and not less than five feet three inches in height. The mental examination, which will be entirely in writing, will be confined to the following subjects: Mathematics (including arithmetic, algebra, geometry, and trigonometry), physics, chemistry, grammar, composition and rhetoric, history, spelling, geography, literature, language (German, French, or Spanish), and general information. This examination will be conducted by a board of line officers of the revenue cutter service, to be designated by the secretary of the treasury. The standard of proficiency has been fixed at 75 per cent. While applicants, as a rule, will not be accorded more than two mental examinations, exceptions may be made and a third examination granted in particularly meritorious cases where an applicant has successfully passed one examination, having failed of appointment through lack of vacancies only. The examination will be strictly competitive. Candidates who pass the required standard in both the physical and mental examinations will be eligible for appointment, and their names will be placed upon a list in the order of proficiency exhibited by them, respectively, in the mental examination. From this list names will be taken in regular order for appointment to fill existing vacancies and such as may occur before the class for the year is made up. The examinations will be held at the treasury department, Washington. No part of the expense incurred by any candidate in going to or returning from Washington, or while undergoing examination, will be defrayed by the government. The mental examination will occupy about four days. The probationary term of cadets is two years, during which time they will be required to pursue a prescribed course of study, and to perform such duties on board ship or el ewhere in the service as may be assigned them by proper authority. During the probationary term they will be examined semi-annually in those subjects in which they have been instructed. Should the cadet fail to attain the standard in two successive examinations, or in the final examination at the end of the course, he will not be continued longer in the service. Those who pass a satisfactory probationary term will at its conclusion be examined for appointment to the grade of third lieutenant; but a cadet whose term has not been satisfactory, and the deficiency be due to any other cause than long continued illness, will be permitted to resign or will be dropped from the service.

The Graham and Morton Transportation Company has bought the steamer R. C. Reid from Robert Reid for $18,000 cash, and will, it is said, alter her into a double decked freight boat to run between Chicago and St. Joseph. The Chicora is having plates put on her bottom and will, with the Reid, form a winter freight route between the two points.

Tips From the Man on the Dock.

The opponents of the whaleback die hard. The other day I happened in Detroit and picking up an evening paper the following met my eye in the marine column: "McDougall's whaleback tug Islay at West Superior needs a new boiler so soon. She is only a year old." This seems a trivial item in itself but for the fact that all marine items in Detroit papers tend towards belittling the work of outsiders, and the "whales" have come in for more than the usual dose of criticism. Passing over misstatements as to the boat's age, has the learned "marine" who evolves the nautical notes for the combined Detroit press never known of anything but a whaleback requiring new boilers after a season or two's work? If he hasn't let him inquire round a little and he will learn something. And by the way the Islay isn't any more a whaleback than is the ferry boat on which the aforesaid "marine" rides to and from Canada. A little further down the same column I notice a billious paragraph charged to a "Buffalo exchange" in which great stress is laid on the wetting of cargo by the Colgate, and stating that the underwriters were wondering how the dickens the water got in, and that they were thinking there was something radically wrong with whaleback construction. When the learned underwriters are puzzled, what hope is there for the ordinary mortal? Yet fools might happen to rush in where angels fear to tread. He says this wetting indicates that she had a narrow escape from breaking in two. I suppose she broke part way anyhow. And I suppose also that no other boat but a whaleback ever wet a cargo. Methinks I do remember me of divers instances where the "regular pattern" disgorged many a bushel of damp unwholesome stuff, but that was an act of providence. Or perhaps they were so tight that sweating did it all. The able-bodied falsehood is also started on its travels that the "whales" never pass through a storm without wetting a good part of their grain cargoes. Just wait till "Mac" gets after that marine! And that specter that was raised by other builders and labeled "light construction" is once more brought before the curtain and makes its bow. I thought "Mac" had laid that out when he met it traveling under the auspices of a certain shipbuilding firm and offered to back the weight of material in his smallest "whale" against that in their largest steamer. Somehow or other the offer was neglected. I presume the other firm was too busy to attend to it. I never heard of any whalebacks going back to the yard to be strengthened, but I do remember what a scurrying there was amongst the "regular pattern" to get in out of the wet last fall and get a bracer or two (ninety odd tons in one case and over a hundred in another) "not because they needed it but just because the owners and builders thought it best to be sure and be on the safe side."

And now I remember that right in this same column I saw another paragraph that is quite pat. It concerned the Canadian steamer Rosedale. Here it is in full: "The Canadian steamer Rosedale had a wild time during the Oct. 14 gale on Lake Superior. Five pumps were kept going continuously. The boats were all washed away, the 4-inch iron davits breaking as easily as if they were matches. All hands wore life preservers as they toiled. The spray put out the masthead light, 36 feet above the deck. During 36 hours the men never slept and had only wet bread to eat. Half of the cargo was damaged. The Rosedale was built across the Atlantic." Now how is this thus? A steamer built for the Atlantic trade, as the Rosedale was, and by the great British nation, and which was held up to us when she came here as "just the thing you know," ought to be superior to anything we can scare up in the way of a blow on "these here bloomin' ponds." But as you see she was out in the same blow as the Colgate and wet over half her cargo; and all this although she wasn't a "whale." What's the matter with the underwriters there? But then she got ashore on Lake Superior last spring the barge company fixed her up and they probably hoodooed her. I saw it stated in an eastern marine paper a short time ago that many believe McDougall has horns, a tail, &c. This lends some color to the belief.

It is now only a little over four years since the first whaleback scared the old timers up into the woods. It was called a pig. It certainly wasn't a bird. Just the same it had a litter and bye and bye one of them crossed the Atlantic, and when the savants "at 'ome" saw it, oh how they smiled and scoffed and pointed at it the finger of scorn! Especially did the London Engineer make merry over the "blawsted Yankee invention." But they got right at it to build others as near like it as they could get. Of course they missed lots of the good points, but we should not expect them to catch on too soon. The first one they built they called the Turret, and the Engineer gave a very flattering illustrated notice to the "new type of cargo boat, brought out by Messrs. So & So." I saw recently in the same paper a statement that the company operating her, the Turret Steamship Company, had whacked up a 20 per cent. dividend on less than a year's business. Today I was shown in the same paper full page illustrations, detail drawings, &c, of a genuine whaleback torpedo steamer of large size, spoon bow, arched cross-section and all. The editor serenely says "we suggest a new type of boat," &c, &c.

Coming back to our own lakes, I have never heard of any of the "whales" suffering from stress of weather. Yet several of the "regular pattern" caved in this fall's gales and many a brave fellow went with them, and from sheer stress of weather too. More than one lake shipbuilder has tried to get as near the whaleback pattern as he dared, even though they scoffed at the same time. And while we are at it, there is at least one "whale" on the lakes whose work no other type of boat has ever equaled; at least so her owners say and they have had all kinds. I refer to the Pathfinder. I heard an old captain, who sails a modern fine steamer less than four years old, say that no matter what trim he was in or whether the Pathfinder and her big consort were light or loaded, she passed him just the same. I heard one of her owners say that dull as freights are and have been all the season, she will pay 16 per cent. I fancy mighty few of the "regular pattern" will do more than square themselves. Give us more "whales" and let the underwriters croak. But it isn't the underwriters who are doing the croaking. It's the people who can't build whalebacks.

Steam Tonnage on the Lakes.

Thirty-eight per cent. of the steam tonnage inspected in this country by the officers of the steamboat inspection service during the year ending June 30, 1893, was in service on the lakes. This means, practically, that 38 per cent. of the steam tonnage owned in this country is on the lakes, as steam vessels are inspected once a year. Figures proving this statement will be found in the following table, which is taken from advance proofs of the report of James A. Dumont, supervising inspector-general of steam vessels, and which again verifies the claim that not only is the steam tonnage of the lakes greater than that of the Atlantic, but it is greater than the Pacific coast, western rivers and gulf coast combined:

STEAM VESSELS INSPECTED IN THE SEVERAL DIVISIONS OF NAVIGATION DURING THE FISCAL YEAR ENDING JUNE 30, 1893:

DIVISIONS.	Steamers.	Net tonnage.	Officers licensed.
Northern lakes	2,139	652,923.60	9,136
Atlantic coast	3,519	588,524.83	15,736
Western rivers	1,012	159,968.15	6,560
Pacific coast	632	154,031.31	3,426
Gulf coast	535	66,083.61	2,937
Total	7,837	1,621,531.50	37,795

Of fourteen inspection districts in which the tonnage is above 35,000 net tons, seven are on the lakes, and New York alone exceeds either Buffalo, Cleveland or Chicago in the number of vessels inspected. The following table shows the number of steamers, net tonnage and officers licensed in fourteen leading local districts:

LOCAL DISTRICTS.	Steamers.	Net tonnage.	Officers licensed.
New York	1,169	297,428	5,708
Buffalo	349	148,005	1,518
Cleveland	308	137,277	1,284
Chicago	290	133,853	1,232
San Francisco	256	102,559	1,717
Philadelphia	369	61,460	1,501
Milwaukee	226	59,465	865
Baltimore	310	58,743	1,527
Boston	485	58,109	1,986
New Orleans	288	54,270	1,749
Detroit	164	51,135	981
Port Huron	208	50,930	1,110
St. Louis	160	41,698	1,197
Duluth	156	35,357	499

Other Proposed Changes in Steamboat Laws.

In addition to changes in the steamboat laws proposed by Inspector-General Dumont and referred to elsewhere, the following recommendations are made in his annual report:

"It has been suggested, and there are cogent reasons therefor, a principal one of which is, that inasmuch as fees are no longer collected for the issue of licenses to officers of steam vessels that the necessity for annual renewals of such licenses no longer exists. This office is thoroughly in accord with that view of the subject, and can see no reason why it would not be well for Congress to amend sections 4,439 to 4,442, inclusive, of the revised statutes by striking from such sections where they occur therein the words 'for the term of one year.' With these words eliminated, licenses would be, as they ought to be, permanent, unless for causes stated in the body of the statutes it is proposed to amend; but, if the statutes are amended as proposed, they should be further amended to preserve the statistics of the service, so that all licensed officers should be required once in each year to report either personally or in writing to the local board that granted the license that they are still actively employed thereunder; it being further provided that any licensed officer failing to report for registry for three successive years shall have his license revoked, to be restored only upon application to the inspectors, satisfying them by examination of his continued ability to perform the duties for which he was licensed. Without this provision, or something similar, it would be impossible after a few years for the government to determine how many active licensed officers there were in the service.

"I would further recommend a change in the law, section 4,434, revised statutes, which limits the thickness of material of the shells of externally-fired boilers to twenty-six-one-hundredth of an inch, now only applicable to such boilers when built to be used on rivers whose waters flow into the Gulf of Mexico, so as to allow such externally-fired boilers to be built of material of thirty-one-hundredths of an inch thick, as was allowed under section 4 of the act of congress approved July 25, 1866. If any satisfactory reason existed for reducing this thickness in the present steamboat laws—act of Congress approved Feb. 28, 1871—it does not appear of record. That no harm is likely to result from the proposed change is satisfactorily shown from the fact that, by an amendment to section 4,434, revised statutes, approved Feb. 11, 1885, material not exceeding fifty-one-hundredths of an inch thick was allowed on externally-fired boilers 'used on steam vessels navigating the Atlantic and Pacific oceans, or salt water bays or sounds, or the great lakes, or any of them;' under which conditions large numbers of boilers upon our largest steamers have been built and used for a period of seven years without more deterioration than the ordinary internally-fired boiler with unlimited thickness of shell. In view of the fact of the impossibility of rolling sheets of boiler plate to an exact thickness, there should be a proviso in the law that no plate should be rejected for use if found in excess of thirty-one-hundredths of an inch thick if the average thickness of plate does not exceed such dimensions, it being further provided that the steam pressure shall be determined from measurements indicating the least thickness of the plate."

To Members of the Shipmasters' Association.

Notice has been sent out to members of the Shipmasters' Association by the grand financial secretary, W. A. Collier, V. O. T. office, Cleveland, O., that assessments numbered 28, 29 and 30 are due and should be paid within thirty days. Members are requested to give their earliest attention to these assesments, in order that death claims may be paid beneficiaries, with some of whom the amount is needed.

A curious incident of wreck by sea occurred in connection with the loss of the ship Joseph S. Spinney, which was stranded and abandoned on the Pacific coast over a year ago, while on the voyage from New York for San Francisco. The body of Mrs. Cadwell, who died in New York, was being taken on the ship for burial in California, in a metallic coffin. When it was discovered, after nearly twelve months, that considerable of the ship's cargo could still be salved, wreckers went to work at it, and recovered a great deal, including the metallic coffin, in which, upon being opened, the body was found in a very fair state of preservation, and after its long and hazardous ocean experience it was finally interred ashore with regular funeral ceremonies.—Marine Journal, New York.

North German Lloyd Company.

This company is now building six new steamers, an unusual number for any one company to have in course of construction at the same time. The largest of them are two twin-screw steamers for the Imperial mail line to China of 6,500 tons capacity each, two twin-screw freight and steerage passenger steamers for the Roland freight line to New York of 3,800 tons, and two smaller steamers for the South American line to the River Platte. The tonnage of the North German Lloyd now exceeds that of any other steamship company in the world. Including the vessels now building it amounts to 230,567 tons, or about 10,000 more than the next largest steamship company, the Peninsular & Oriental, and more than double that of the Cunard line. The company now operates eighteen distinct lines and owns seventy-eight ocean steamships. In 1892 the North German Lloyd Company carried 203,408 passengers, 20,049 of whom were cabin passengers. The Cunard Steamship Company carried the next largest number of cabin passengers, some 16,065 in number. The Lloyds landed in the ports of New York and Baltimore 117,016 steerage passengers, the Hamburg-American Packet Company being next with 61,738 to their credit—about one-half the number. In 1892 the Lloyd steamships sailed 2,840,824 miles, a distance equal to 131 times around the globe. The marvelous growth of this company is best shown by some statistics. Its total tonnage in 1858 was 15,255 tons; it is now 230,567 tons. The number of passengers carried in 1858 was 1,870; last year it was 203,408. In 1858 the total mileage was 28,520; in 1892 it was 2,840,824. In thirty-five years the tonnage has increased fifteen fold, the passenger traffic 109 fold and the mileage 100 fold.

A very interesting report of the company is that of receipts and expenditures.

The receipts Oct. '93 to Dec. '93 are given as.....	2,592,855 marks.
The expenditures for the same period.....	794,482 "
Leaving a reserve fund of.....	1,798,373 "

A very profitable undertaking is this ocean steamship business; even the carriage of steerage passengers. The company employs about 10,000 persons, not including those employed in their agencies in almost every city in the world.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Nov. 4, 1893:

	Wheat, bu.	Corn, bu.
Chicago	19,107,000	2,649,000
Duluth	5,638,000	.....
Milwaukee	817,000	.....
Detroit	1,237,000	13,000
Toledo	1,946,000	238,000
Buffalo	3,267,000	875,000
Total	32,012,000	3,775,000

At the points named there is a net increase for the week of 799,000 bushels of wheat and a net decrease of 228,000 bushels of corn.

Use of Soap-Suds in Storms.

Through the efforts of the United States hydrographic office, masters of United States vessels on the coast are taking quite generally to the use of oil in storms, and the officers of this service are also constantly in receipt of reports from masters of foreign vessels who have tried oil in heavy weather, and who are desirous of encouraging a more general use of it. There is no doubt that during the tropical cyclones in August and October last loss of life was largely averted by this means, as shown by reports received at Washington. Recently the use of soap-suds has been found to be of service. The grease of the soap-suds is the effective agency. It is recommended on the score of economy. Masters of lake vessels who made trials of either oil or soap-suds will confer a favor by reporting the results to the Chicago office of the hydrographic service.

In Great Britain the officers of the light-house service have begun the work of joining up light-ships and light-houses in circuit with the telegraph system of the country. Congress should not hesitate in making the appropriations necessary to further work along this same line here.

Importance of Col. Ludlow's Appointment.

Special Correspondence to the MARINE REVIEW.

WASHINGTON, D. C., Nov. 9—Official announcement is made of the appointment of Col. William Ludlow, corps of engineers, U. S. A., to succeed Major J. C. Post as military attache at London, Eng. Col. Ludlow's numerous friends, who proved so loyal to him in the St. Mary's river lighting matter, have cause for gratification. The appointment is the most complimentary at the disposal of the war department and was so intended. There are three or four army officers stationed in Europe at the principal capitals, and the military attache to the United States embassy to the court of St. James heads the list. He is part of the ambassador's official household, and in addition receives special instructions from the war department at home. His duties involve participation in official functions, &c., and more particularly to keep the war department advised of everything of interest or value from the military and professional point of view; to make special examinations from time to time and report on engineering and military works and occurrences; make purchases of material when needed, negotiate contracts, &c. His functions are not confined to London, but may cover other points as well—France for example—and involve more or less getting about and experience in other countries and with other services. The field is a broad one that permits of about such work as may be prompted by the incumbent's interest, ability and opportunities.

Lieut.-Col. Garrett J. Lydecker, now at Louisville, Ky., has been assigned to conduct the river and harbor work which Col. Ludlow leaves in the Detroit office. It is not known when Col. Ludlow will sail for London, but he will probably go before the close of the present month, as the work in the Detroit office, alike to that of all other offices of the engineer corps, is always in readiness for such changes.

Inventions of a Marine Nature.

Specially reported from the patent office, Washington, D. C., for the MARINE REVIEW.

567,522.—Electrical steering machinery, by Charles W. Ayton of New York City; filed July 13, 1892.

507,590.—Automutic bathometer and shoal indicator, by Nicolaus Potschinsky of Odessa, Russia; filed Dec. 27, 1892. The device is essentially a pivoted feather operating an electric contact.

507,856.—Ship brake, by Ferdinand Tobias of Munich, Germany; filed Jan. 28, 1893. Wings are expanded from the sides of the ship by means of gearing on the main shaft.

507,944.—Apparatus for lessening the roll of vessels, by John I. Thornyer of London, England; filed Nov. 26, 1889. By means of long and short period pendulums and proper actuating motors, a steadying weight, balanced on the line of the ship's gravity, is so moved as to counteract, in part, the rolling motion.

507,953.—Brake for capstans, by Edwin H. Whitney of East Providence, R. I.; filed July 5, 1893.

Copies of specifications accompanying these patents can be had at 15 cents each upon application to the MARINE REVIEW, 516 Perry-Payne building, Cleveland, O.

From an Authority on the Subject of Transportation.

Emory R. Johnson, Ph. D., is a specialist upon the general subject of transportation, and lectures upon topics connected therewith in the Wharton School of Finance, of the University of Pennsylvania. He recently prepared a treatise on "Inland Waterways—Their Relation to Transportation," which was published by the American Academy of Political and Social Science. It presents facts about the existing conditions of inland waterways in America and elsewhere, and discusses their economic and social significance, and the question of state vs. private control.

In the November number of the Review of Reviews, Dr. Johnson has an extended article on "Inland Waterways for the Northwest," in which a wonderful knowledge of the subject of transportation generally in this country is shown. The article treats of lake commerce and the commerce of the Mississippi and Hudson rivers, together with government appropriations for these waterways and the methods of expending these appropriations. This is followed by a discussion of the Columbia river project and such prospective canal routes as that from the lakes to the seaboard, the Hennepin and the Nicaragua.

In all of his writings Dr. Johnson refers to the lakes as "not only our greatest waterway, but the most important inland highway of commerce in the world. "The public is no longer apathetic" he says, "concerning the extension and wider use of inland waterways. The steadily increasing demand for cheap rates has led shippers to increase the volume of water traffic, and the liberal policy which Congress has pursued in the improvement of natural water routes has made possible the rapid growth of this inland commerce. The statistics of the traffic on our more important natural waterways show this in a striking way. During the census year, 1889, the Ohio river above Cincinnati, including its branches, had a fleet of 5,214 boats and barges, by means of which 10,744,063 tons of freight, mostly coal, were carried. The ton mileage of this freight was over two billion ton miles, or two and seven-tenths per cent. of the ton mileage of the rail traffic of the entire United States during the year ending 1890. The freight on the rivers of the Mississippi valley in 1890 was placed at 31,050,058 tons. This is about five per cent. of the tonnage of the railroads for the same year, and is probably less than the amount actually transported. The freight traffic on the Hudson river, during the same year, was 15,000,000 tons, or, including the 3,500,000 tons that it received from the State canals of New York and floated to tidewater, 18,500,000 tons—a sum nearly equal to three per cent. of the total rail freight. On the great lakes the traffic is enormous. During the year ending June 30, 1892, 10,107,603 tons of freight passed St. Mary's lock, between Lake Superior and Lake Huron, enroute for such distant ports as Chicago, Cleveland, Buffalo and Liverpool. The tonnage of the great lakes is equal to ten per cent. of that carried by all our railroads, while the ton mileage of this lake freight is fully 25 per cent. of that of the railroads.

"The magnitude of the traffic on the important inland waterways of the United States is well illustrated by the following comparison: The Pennsylvania railroad, on the 459 miles of its main line, the world's greatest freight carrier, had a traffic of 69,036,245 tons in 1890, a sum a little larger than the freight on the great lakes and New York canals. The Reading's main line, 327 miles in length, had a traffic of 15,625,482 tons, nearly the same as the Hudson river. The New York Central and Hudson River Railroad carried on the 849 miles of its roads 29,473,879 tons, practically the equivalent of the Mississippi river and its tributaries. The total tonnage on these three trunk lines, whose combined length is 1,605 miles, was 114,135,558 tons; the four waterways named carried very nearly the same amount—112,916,233 tons. But this is comparing tonnage; were the ton mileage of each contrasted the waterways would make a much larger showing than the railroads."

Iron Mining Matters.

Shipments of iron ore from Two Harbors up to and including Wednesday, Nov. 1, aggregated 859,113 gross tons and were divided as follows: Chandler, 415,778 tons; Minnesota, 353,802; Zenith, 12,998; Cincinnati, 9,939; Canton, 24,412; Franklin, 39,991; Hale, 2,176. Shipments of Gogebic range mines through Ashland up to and including Saturday, Oct. 28, foot up 1,064,037 tons, divided among the different mines as follows: Ashland, 39,512 tons; Aurora, 165,615; Colby No. 2, 52,233; Tilden, 134,822; Germania, 4,975; Iron Belt, 19,353; Montreal, south vein, 2,606; Montreal, north vein, 31,462; Eureka, A, 1,949; Brotherton, 14,643; Comet, 9,603; Eureka, 26,029; Careys, 32,515; Newport, 109,717; Norrie, 228,476; East Norrie, 78,135; Palms, 2,657; Pabst, 91,891; Jack Pot, 1,651; Davis, 13,282; Sunday Lake, 20,904.

Iron Ore describes the electric motor system of haulage in the Lake Angeline mine. Power is applied to the motor, which is capable of drawing twenty two-ton cars, by a trolley, and there is a distance of about 1,100 feet to be traversed from the farthest ends of the drifts to the shafts. Considering the advantages of this system of haulage on surface railways it seems strange that the Lake Angeline is the only company that has as yet put in motors with the necessary wires and power for their operation.

At the meeting in Cleveland a few days ago of the board of directors of the Republic Iron Company, at which it was decided to resume mining at the Republic on Dec. 1, the question of having the company acquire mineral property on the Missabe range with a view to engaging in mining operations on that range came up, but no decision was reached, there being some opposition to the proposition among the members of the board.

Although the Minnesota company is thought to have shipped more unsold ore than any of the other large mining companies, it is probable that a part of the non-Bessemer in stock pile, from which shipments are now being made, will be left over. All of the Minnesota Bessemer has been shipped.

Chicago capitalists have an option on the Missabe Chief, one of the new range properties, and are said to be contemplating a purchase at $250,000. It is a state lease, 25 cents royalty.

The Toronto corporation formerly known as the Doty Engine Works Company and later as the John Doty Engine Company, Limited, is now the Bertram Engine Works Company. This is the company into whose employ Mr. A. Angstrom entered on leaving Cleveland a short time ago. They are equipped for the manufacture of marine and stationary engines and boilers and expect to build a steel vessel or two during the coming winter. They also have the right to manufacture the Roberts and Mosher water tube boilers in the dominion.

Reversal in an Admiralty Case.

In the United States court of appeals, sixth circuit, Judges Taft, Lurton, Ricks and Lacombe, sitting at Cincinnati, on Monday decided an admiralty case that has created considerable interest on the lakes. The case was that of Vance and others vs. the Wilhelm, and the high court reversed the decision of Judge Hammond, delivered in the district court at Detroit on March 25, 1891, and which was upheld by Judge Jackson in the circuit court, eastern district of Michigan, Dec. 30, 1891:

On Nov. 26, 1889, the propeller Wilhelm, with the schooners Mears and Midnight in tow, all lumber laden, left the port of Cheboygan, Mich., bound for Tawas. At 4 a. m. Nov. 27, the tow passed Thunder bay light, at which time the weather was unsettled, wind from the eastward and sea moderate. About 7 o'clock the tow was struck by a heavy squall from the E. N. E. to N. E., accompanied by snow, and from that time until the loss of the barges on Fish point, at about 2 o'clock p. m. the wind blew a gale from E. N. E. to N. E., accompanied by frequent violent snow squalls and a heavy sea. About 9 a. m., when off Sturgeon point, the Wilhelm lost her starboard deck load, causing her to list so much to port as to interfere with her steering, at which time a cast of her lead gave six fathoms of water. Whereupon she rounded to and headed the wind, until her cargo was trimmed to right her, when she went off upon her course, which was a little to windward of the usual running course for Tawas. About 1:30 p. m. a cast of the lead gave six fathoms. A blinding snow storm was then raging, and the master of the Wilhelm, deeming himself far enough to the southward, until he could ascertain his exact position, decided to haul into the wind, and hold there until it broke so he could pick up the land. After rounding to and while holding head to wind and sea the line between the Mears and Wilhelm parted and both schooners were driven on shore near Fish point and became total wrecks. The owners of the Mears filed a libel against the Wilhelm, charging as the cause of their loss negligent management in the following particulars: First—In that said propeller attempted to tow the schooners Mears and Midnight across Lake Huron during a violent and increasing storm, without regard to the condition of the weather existing after passing Thunder bay light, instead of taking said tow to a near, accessible and safe shelter in Thunder bay, as she could have done without difficulty, and was required by ordinary care and seamanship. Second—In negligently failing to come about and hold her said tow head to wind and seas after the loss of her deck-load. Third—In negligently hugging the west shore of Lake Huron in a thick driving snow storm with a heavy wind and seas from the eastward. Fourth—In negligently turning at full speed into the lake so sharply as to part the tow line to said Mears, whereby said schooner was necessarily rendered helpless, in such close proximity to a lee shore that her destruction was inevitable.

Judge Hammond's decision in this case was, at the time it was rendered in Detroit, the subject of considerable humerous criticism. Here is a concluding paragraph from it:

"Lastly we come to the parting of the tow line. It is said that this was caused by too abruptly turning about in hauling to, head to the wind, off Fish point. It seems to the court quite idle to seek for any other cause for the parting of this tow line than the resistless force of the storm itself, described in the proof to have been the most violent and destructive that ever swept Lake Huron. Why should we go, as has been done in the trial and argument of this case, below the decks of this propeller, laboring in a mighty storm, from which her cargo was being swept by the angry waters, and examine her flooded engine-room her diminished steam and somewhat shackeled engine, listen for the sound of her signal above the howling of the furious winds, watch the haste and trembling movements of her death-threatened officers and crew, to inquire whether this turning of the wind, almost *in extremis*, for safety from the driving storm, was more or less abrubt in its relation to the tow line chafing in its chock, although sufficiently parceled, they say, or whether everything here was done precisely as it ought to have been done in the face of such an extraordinary storm, when we find in its violence a tremendous and unusual force, abundantly capable of causing this disaster? The court finds the parting of the line to have been caused by the fury of the storm, and that it was the act of God, against which the owners of the Wilhelm did not insure the vessel of the libelants."

T. H. Canfield and H. C. Wisner of Detroit represented the Wilhelm, while Simonson, Gillet & Courtright and H. D. Goulder of Cleveland were attorneys for Vance and others.

Sinking of the Philadelphia and Albany.

The collision off Point au Barques, Lake Huron, Tuesday morning, between the Western Transit Company's steamer Albany, and the Philadelphia of the Anchor line, resulting in the loss of both boats and twenty-four lives, was the most disastrous accident of its kind that has occurred on the lakes for many years. Engravings of both boats appear in a supplement accompanying this issue the REVIEW. As both boats are lost, the law limiting liability will probably prevent any action between owners or underwriters in court. There should, however, be a thorough investigation of facts connected with the collision. As yet no reliable statement has been made by the officers or any of the surviving members of the crew, and criticism would be unjust, but all of the facts regarding this accident should be made public.

Photographs of the Albany and Philadelphia.

We have very good photographs of the package freight steamers Albany and Philadelphia, which sunk each other this week. The pictures are 7½ by 9½ inches and they are mounted on 11 by 14-inch cards. The collision was the most disastrous that has happened in many years. The pictures will create wide interest and will be valuable curiosities. The two will be sent to any address for $2. Address the MARINE REVIEW, No. 516 Perry-Payne Building, Cleveland, O.

Around the Lakes.

Underwriters have sold the wreck of the schooner James Mowatt as it lies in Milwaukee to J. W. Squires of Marine City for $7,250.

White hulls and buff smoke stacks are the colors talked of in connection with the work of painting the new Northern line passenger steamers.

A dispatch from West Bay City says that F. W. Wheeler & Co. of that place have contracted to build a wooden ferry boat for the Belle Isle route at Detroit at a cost of $60,000.

The steamer Pentland, owned by William P. Loutit, was launched at the yard of the Grand Haven Shipbuilding Company Saturday. The boat has a lumber carrying capacity of 950,000 feet.

On account of the Dean Richmond disaster on Lake Erie, Representative Hooker of New York has introduced in the House a bill (H. R. 4,321) providing for a life saving station at or near Dunkirk.

Owners of the passenger steamer Manitou gave a dinner in Chicago on Thursday last in honor of W. I. Babcock, general manager of the Chicago Ship Building Company. Mr. Babcock was also presented with a testimonial from the owners of the boat, which was built by his company.

Commander Green of Buffalo gives notice that the removal of the buoys in Lake Erie and the Detroit river will begin about Nov. 15, and probably be completed by Nov. 30. Small scantling buoys will be left, as usual, to mark the more important stations, in place of the buoys removed. The buoys in the Niagara river will be left in position as long as possible, and on their removal, no small buoys will be left in these localities.

Here is a gem clipped from a newspaper account of a storm on Lake Superior: "It appears that several Cleveland boats had rough experiences in the northwest gale on Lake Superior, last week. 'The Caledonia drew only eleven feet,' said a passenger on the boat, 'the lake was forty-eight feet deep, and the waves were so high that the steamer actually touched bottom when we were in the trough of the sea. This makes the waves over thirty-five feet high.'"

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 706 Phoenix building.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580 50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

DURING the session of Congress which closed last week, a bill was introduced providing that material for marine boilers be inspected by officers of the steamboat inspection service at the steel works at which it is manufactured. At present such material is inspected by sample in the offices of supervising and local inspectors in different parts of the country. The proposed change did not bring up a new question, as the present practice of making tests in the offices of the inspectors had been criticised in the past, and it was generally understood that Gen. Dumont, the head of the inspection service, was opposed to having inspectors go into the steel works, on the claim that their associations and close relations with the manufacturers might result in less efficient tests than are now secured. The annual report, of the inspector-general, just at hand, would indicate, however, that a mistaken view of his position has been taken by outsiders, or that he has performed an acrobatic feat suited to the desires of congressmen who are supporting the measure referred to. He now recommends that assistant inspectors from local inspection districts be detailed to perform this work in the mills. This means, of course, that the machines of the manufacturers will be used, instead of the government machines, and that the inspector performing this work will be subjected to the "influences" that were urged as an objection to the bill in the past. As we have held in the past, a change should be made in the present method. The manufacturers should be relieved of the disadvantages of the rules as they now exist. But it would seem that the interests of owners and builders of vessels, as well as care for the life and property involved, would be best subserved by having an inspector detailed to see samples cut from material and to mark in duplicate the sample and the piece from which it is taken. Then let the samples be forwarded by the inspector to the nearest office of the service for a test that would be conducted free of any influence from the manufacturer, and there need be little delay in reporting as to whether the piece from which it was taken is all right or not.

A CIRCULAR from the treasury department announces that at the next regular annual meeting of the board of supervising inspectors of steam vessels in Washington, Jan. 17, 1894, the board will consider and act upon a law passed March 3 last, which provides that "the lights of ferryboats, barges, and canal boats, when in tow of steam vessels, shall be regulated by such rules as the Board of Supervising Inspectors of Steam Vessels shall prescribe." The proposition to change the present rules regarding lights on such craft comes from New York vessel owners and from Mississippi river interests. There is no general demand for any change in the rules regarding lights for lake vessels, and it would probably be well for the Lake Carriers' Association to so inform the inspectors, in order that nothing may be done that will cause annoyance hereafter. The circular announces that all persons interested are invited to communicate, in writing, with the supervising inspector-general, submitting such suggestions, diagrams, etc., as may in their opinion seem best to carry out the purpose of the law quoted. Communications must be forwarded to Washinglon before Jan. 1, as it is intended to print all matter pertaining to the proposed changes in the rules.

THE meeting of the Society of Naval Architects and Marine Engineers in New York next week will, of course, not be as elaborate as the international meeting of engineers and naval architects in Chicago a short time ago, which was a part of the engineering congress connected with the World's Columbian Exposition. Papers presented to the Chicago congress were drawn from all Europe, but the New York meeting will be dependent upon home talent. The significance of the New York meeting is, however, worthy of note. It shows that there is progress in ship building sufficient to cause the formation of a society of the kind that has had a great deal to do with the upbuilding of the industry in other countries.

IN ANSWER to a letter of inquiry, Edward Hannan, superintendent of public works in the state of New York, informs us that there will be tests made with electrical power for canal navigation on the Erie canal near Rochester in about two weeks. There has been $10,000 appropriated for the expenditure of the public works' and engineers' departments in making the experiments and to meet the expenses of electrical experts for the work.

New Keels.

Notwithstanding that the season which will soon close has not been as profitable as former seasons, there will be considerable tonnage turned out of lake ship yards in the spring. It is a little early to report any contracts for the big steel plants, but the wooden ship yards on the rivers have already begun operations on several new vessels. At the West Bay City yard of James Davidson keels for two steamers and a consort have been laid down, and no one would be surprised to see as many more vessels under way at this yard before spring. Work is progressing on the steamer building by M.P. Lester at Marine City, Mich., for Curtis & Brainard, and Alex. Anderson, at the same place, is building a barge for N. Mills. M. Sicken of Marine City, Mich., is building a steamer for himself at Morley's yard. R. W. Linn of Gibralter, Mich., is building a steamer to be called the Wolverine, and Duncan Robertson is completing asteamer 185 feet long at Grand Haven, Mich. It has been reported that Simon Langell of St. Clair, Mich., would put down one or two keels during the coming winter and there is said to be a steamer building at Algonac, Mich., for the Mills Transportation Company. The Jenks Ship Building Company of Port Huron, Mich., will probably build during the winter.

In General.

The British admiralty has decided to make a trial of the suitability of seamless steel life boats for the navy.

The November number of Cassier's Magazine contains the last of a series of papers by John Birkinbine entitled "From Mine to Furnace."

In the November number of the Review of Reviews, S. A. Thompson, secretary of the Duluth chamber of commerce, has another article on the "Possibilities of the Great Northwest."

It is estimated by the officers of the steamboat inspection service that between 600,000,000 and 700,000,000 of passengers were carried on merchant vessels of the United States during the fiscal year ended June 30, 1893.

Representative Caruth introduced in Congress on the closing day of the extraordinary session a bill (H. R. 4,346) extending the benefits of the marine hospital service to the keepers and crews of life saving stations. The measure was referred to the committee on commerce.

What is probably the finest oil barge ever built has just been completed at Roach's ship yard, Chester, Pa., for the Standard Oil Company. The vessel has a molded length of 245 feet, beam 37 feet and depth 19 feet, and possesses a carrying capacity of 700,000 gallons in bulk, with a gross tonnage of 1,599. She is schooner rigged and carries four masts.

In the hurry attending the adjournment of Congress after the passage of the silver bill, the Senate failed to take up the House measure providing for an amendment in the steamboat laws to establish more clearly the general understanding that engineers are officers of American vessels. It is not thought, however, that there will be any difficulty in amending the law during the regular session of Congress.

The unofficial speed trial of the United States cruiser Columbia, the first of the new triple screw commerce destroyers, took place outside the mouth of the Delaware river on Oct. 18, and resulted in the attainment of the very satisfactory record of 21.5 knots an hour. The contract speed is 21 knots, and it is anticipated by the builders, the Cramps, that this speed will be exceeded, on the official trial, by a knot or a knot and a half.

Chief Engineer Webster of the bureau of steam engineering navy department, has completed the arrangement of a photographic outfit for the purpose of photographing the drawings of machinery made at the bureau, with the intention of forming albums of the principal drawings of new machinery for the use of the chief engineers of the ships of the newer vessels, and also for the use of the drafting room as an illustrated index of all the work done there. The photographic negatives will be of the uniform size of 8 by 10 inches, that being a convenient size for reference. The outfit is of a very complete description, and the work in progress is of great excellence. The reproductions will be on blue print linen, and will include all the more important parts of the machinery, boilers and pipe plans.

A column in Fairplay of London headed ship building is evidently made up by a writer who was at one time a practical ship builder, and who retains the usual dislike for the man of theory. He never misses an opportunity to show his feelings towards the "professor." "Of late," he says, "there seems to have arisen a great desire for fame on the part of certain naval architects. They are anxious to become burning and shining, lights instead of modestly hiding their light under a bushel. It is only a short time ago since an American periodical proclaimed the fact of the Paris and New York having been designed by Prof. Biles, and now we read of the Campania and Lucania being 'solely' designed by Mr. Richard Saxton White, and almost every week we read in the daily journals of some armor-clad or cruiser having been designed by Chief-constructor W. H. White, C. B. It does not follow, however, that two whites make a black, nor does it follow that these distinguished architects ever put a pencil to paper; indeed, in the majo ity of cases it will be found that the actual designer is some poor devil earning 40 to 50 shillings a week, who is far too modest to let the fact be known, and whose 'gift of gab' is not such as professors are endowed with. To be the 'designer,' or 'sole designer' of such craft as the Lucania or Paris means a comprehensive knowledge of ship building, engineering, electricity, etc., and in all my wanderings I have not come across such a prodigy—and hope I never may."

Water Jet Propulsion for Ships.

Water jet propulsion for ships seems to have peculiar fascination for a great many inventors. Year after year its supposed merits have been dinned into the ears of people likely to interest themselves in it financially, and in a number of cases actual trials have been made with a view of practically demonstrating that the advantages claimed for it really exist. None of these experiments have ever given the slightest encouragement to the scheme; still, like Banquo's ghost, it will not down, and at present it is again being vigorously advertised. Its promises, of course, are of an alluring kind. In place of complicated engines to drive screw propellors or paddle wheels, we have simply, so the promoters tell us, to provide a few pumps, a boiler, or perhaps several boilers, to supply the steam necessary to work them, and a nozzle in the stern of the vessel. The pumps will take in water through orfices in the bow or at the sides of the ship, drive it out at high pressure through the nozzle at the stern, and reaction will do the rest, propelling the boat forward at variously stated speeds. The cost of the whole outfit, it is stated, will be comparatively low, the space occupied, also, will be small, and the expense of the maintenance of the machinery will be materially reduced, as compared with that of the currently used installations aboard ship. The drawback to the whole thing, however, is that the system will not work, or rather that it will not work in a commercially satisfactory way.

It is not necessary to go into anything like a detailed mathematical presentatiou of the subject here in order to show how utterly futile all attempts must be that aim at the useful, practical application of such water jet methods of propulsion. A few figures will be amply sufficient. Let us take, for example, the case of one of several of the boats which were tried a few years ago. As described at the time, the nozzle at the stern of this boat was intended to discharge a stream of water about one and one-fourth inches in diameter, at a pressure of something like 10,000 pounds per square inch, and the speed to be developed was placed at thirty miles an hour, with an estimated horse power of 1,500. The boat itself measured about 110 feet over all, had a beam of twenty-three feet, and a draught of water of about four feet. Theoretically the velocity of the issuing jet should equal the speed of the boat, which in this case would be, approximately, fourty-four feet per second. A simple calculation, then, shows that in order to accomplish what was claimed, about seventeen tons of water per second, or a little over 61,000 tons per hour, would have to be discharged through the nozzle at the stern, a performance which, of course, is preposterous. A scarcely less formidable quantity would have to be handled at lower speeds, so that even at a quite modest estimate of the possibilities of the scheme, no thought of its feasibility can be reasonably entertained. It seems almost needless to say, in the face of this that the boat did not revolutionize things in the way of ship propulsion and that the project was abandoned. Somewhat similar methods, in which jets of steam instead of water were to be used, have also been brought forward at different times. With these, as may be inferred, there was to be even greater simplicity of working outfit than in the case of the hydraulic jets, the boilers which furnished the steam being all there was in the way of machinery. Toy boats a few inches long, propelled after this method, are common enough, but for actual service in any but such boats the steam jet system has probably nothing to commend it over the other. For the same results there would have to be as much steam discharged in the one case as there would be water in the other, and the quantity of coal which would have to be burned under the boilers to generate this steam for even a short time only would be interesting to contemplate. How to find room for it on board of any vessel on which it was to be used, and how to pay for it without entailing hopeless bankruptcy of the users, has never been explained by the advocates of the system.—Cassier's Magazine for November.

Lake Superior Lumber Business.

On several occasions the REVIEW has directed the attention of vessel owners to the great increase in shipments of lumber by lake from the head of Lake Superior and the advantages to be derived from having vessels suited to this trade. A correspondent in Bradstreets points out very clearly the possibilities of this business in the future. He says:

"There is in Minnesota standing pine to the amount of 60,000,000,000 feet, while the state's greatest production in any one year has been 1,600,000,000 feet. In what is now regarded as the Duluth district there is estimated to be not less than 10,000,000,000 feet, part in northeastern Minnesota and part in northwestern Wisconsin, along Lake Superior, and its greatest cut in any year has been 350,000,000 feet. This district is likely to be doubled in importance by the early extension of railways to timber at present inaccessible. The greatest cut of the Ashland district has been some 300,000,000 feet, and it is estimated to contain only about 1,500,000,000 to 2,000,000,000 feet more, being nearly lumbered out. The Duluth and Ashland districts furnish by far the larger part of the Lake Superior lumber output. East of them are the mills of Ontonagon, belonging to the Diamond Match Company, the Keweenaw point mills, and those at Marquette and vicinity and at Deer Park. These points ship all their product to the Chicago and eastern markets by water, with the single exception of Duluth, which is so located that it has a quadruple market, the east, the west, the southwest, and a very large local trade, the last alone amounting in 1892 to 125,000,000 feet. In the season of navigation, now closing, shipments of lumber through the Sault St. Marie canal, which include, of course, al that goes out of Lake Superior to the east, had been up to October 1, 409.717,000 feet. To the same date in 1892, a season longer by twelve days than 1893, the shipments had been about 375,000,000 feet. For the entire season of 1892 shipments through the canal were 512,000,000 feet, or about 500,000 tons. This year they will aggregate a trifle more.

The figures show a decrease for all the districts except Duluth. Deer Park and Marquette last year sent forward about 90,000,000 feet, Keweenaw point 76,000,000, Ashland and Ontonagon 300,000,000 and Duluth about 45,000,000. This year the latter city will close the season with 125,000,000 feet of shipments, Keweenaw point with about 66,000,000, Ashland with not over 250,000,000, and the smaller districts the rest. The advance made by Duluth in the face of the conditions prevalent in 1893 is remarkable, and it is believed to mean the beginning of a change in the base of supplies for the New York, New England and Chicago trade, as well as the western car-lot trade. For the first time in the history of the lumber traffic of western Lake Superior, wholesalers of Saginaw came to Duluth to fill out their stocks, and not far from 40,000,000 feet were sold in the Saginaw market early in the year. Owing, however, to unfavorable monetary conditions, not all of this was taken, but in ordinary circumstances it would have been. Chicago, too, which has heretofore gone no further west than Ashland for the share of its supply derived from Lake Superior, has found itself compelled to seek the mills at the head of the lakes for a part of what it requires, and will be forced to do this in constantly increasing ratio. The eastern buyer, who formerly obtained all he needed from the shores of Lakes Huron and Michigan, the great timber districts of Saginaw, Manistee, Menominee and Muskegon, has seen these sources of supply fail, and must in the future look almost entirely to the Lake Superior region for his stock. As a consequence of all this, the Duluth lumberman, who has heretofore paid strict attention to the wants of the northwestern farmer, is leaving that trade to the interior mills of western Wisconsin and northern Minnesota, which are not advantageously situated with respect to lake shipments, and devoting himself to the more strictly wholesale cargo trade.

"There are not far from fifty-five stationary saw mills scattered along the south shore of Lake Superior, between Sault St. Marie and the divide separating lake waters from those that flow into the Mississippi. While some of these are small affairs there are many of the largest in the United States in the region, one at Duluth being able to cut in every working day 500,000 feet of lumber. A group of nine mills in the Duluth and Ashland districts have an aggregate daily capacity of 2,000,000 feet, running full time. The fifty odd mills in the entire region have a probable annual capacity of not far from 900,0000,000 feet, and this figure is being steadily enlarged, chiefly by the building of mills along new lines of railway in the close proximity to the lake. For many years this region will be the chief source of white pine lumber in the United States. What will result at its exhaustion is a question that is even now of importance."

Trade Notes.

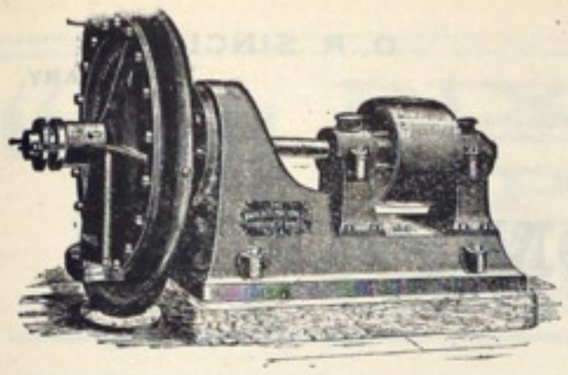
The Bethlehem Iron Company of South Bethlehem, Pa., has shipped to Cramp's yards twenty-seven piston rods for the battle ships Iowa and Brooklyn, and columns and cross-heads for the Iowa.

The American line steamer Brazil was recently fitted with the Serve ribbed tube and the Ellis & Evans combination induced draft. As a result of these changes the steamer made her last passage from Southampton to New York in 8 days 7 hours and 34 minutes, beating her own best previous time from Southampton by five hours.

The Sherwood Manufacturing Company has been awarded at the World's Columbian Exposition first premium medals and diplomas for injectors, boiler tube scrapers, steam flue blowers, engine and dynamo oil cups, cylinder oil pumps, sight feed cylinder lubricators, compression grease cups and improved ball guage cocks, in all eight awards of the highest class.

The schooners David P. Davis and Eugene Hall, bark Harry Morse, and half-brigs Harriet G. and Nettie, all American, as well as the Danish half-brig Georgie A. B., British bark Armenia and German bark Ernst were classed during the past two weeks by the American Shipmasters' Association of New York, publishers of the Record of American and Foreign Shipping.

The Turner & Seymour Manufacturing Company of Torrington, Conn., has placed a contract with the Berlin Iron Bridge Company of East Berlin, Conn., for a new foundry. The old foundry burned a short time ago and the company determined to build the new foundry entirely of iron and brick, the side walls being of brick, the roof of iron. The roof will be furnished by Berlin company and will consist of iron trusses and iron purlins covered with the company's patent anti-condensation corrugated iron. When completed the building will contain no woodwork, excepting the window frames and casings, so that it will be absolutely fire-proof, and it is the intention of the owners to carry no insurance on the building, as the Berlin company guarantees that if all the wooden flasks which the company use at any one time were piled in one place in the building and fired, the roof would suffer no damage.



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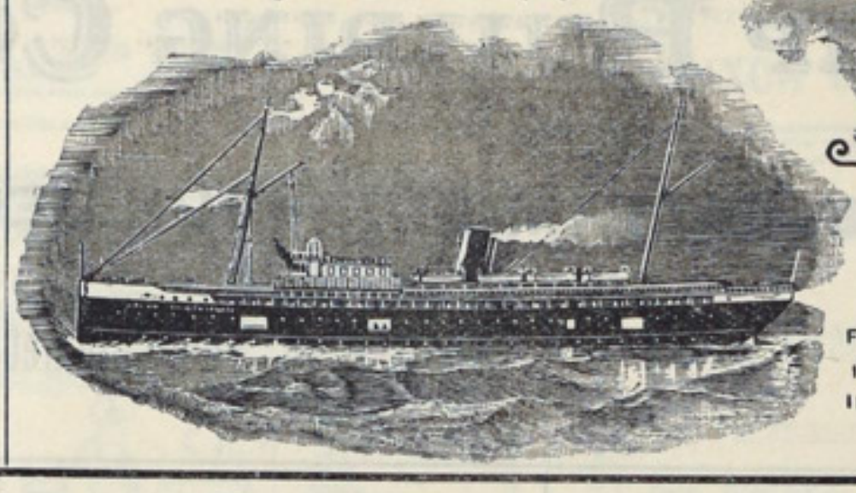

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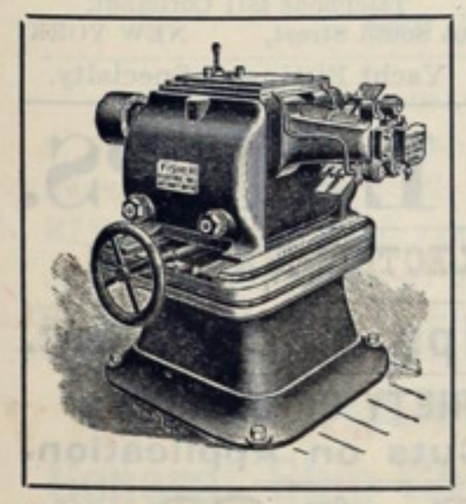

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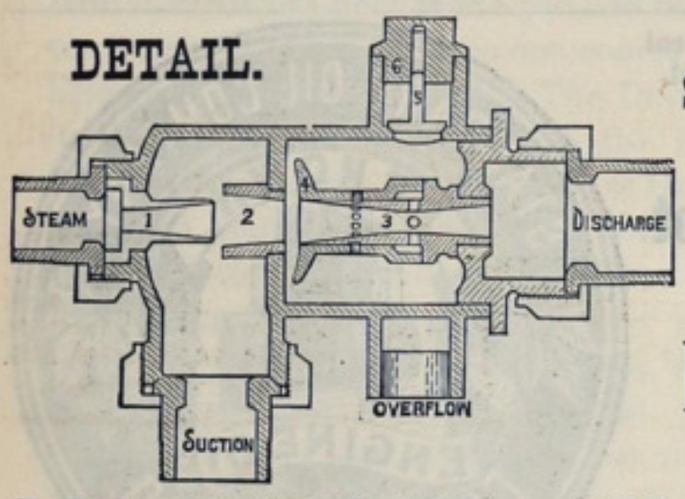

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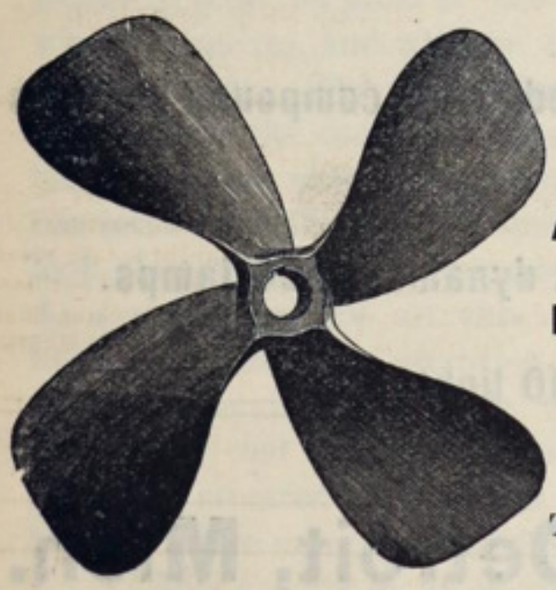

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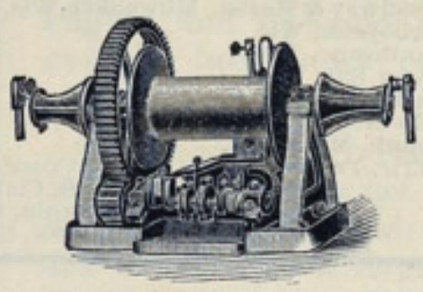

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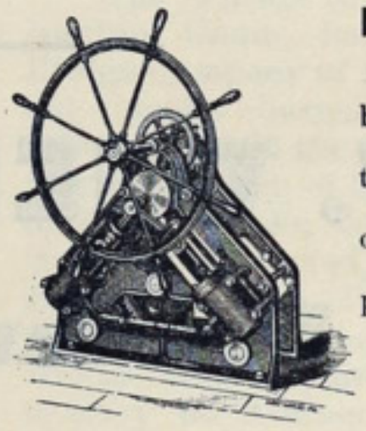

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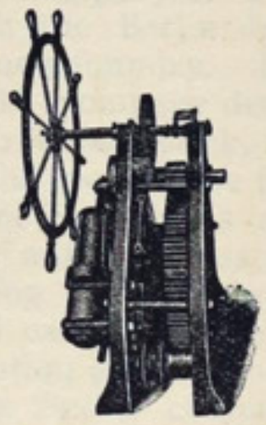

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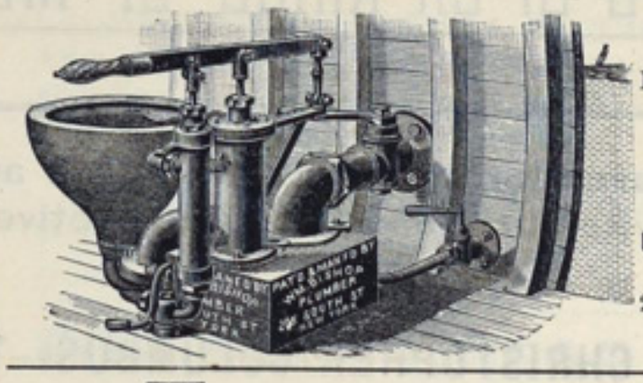

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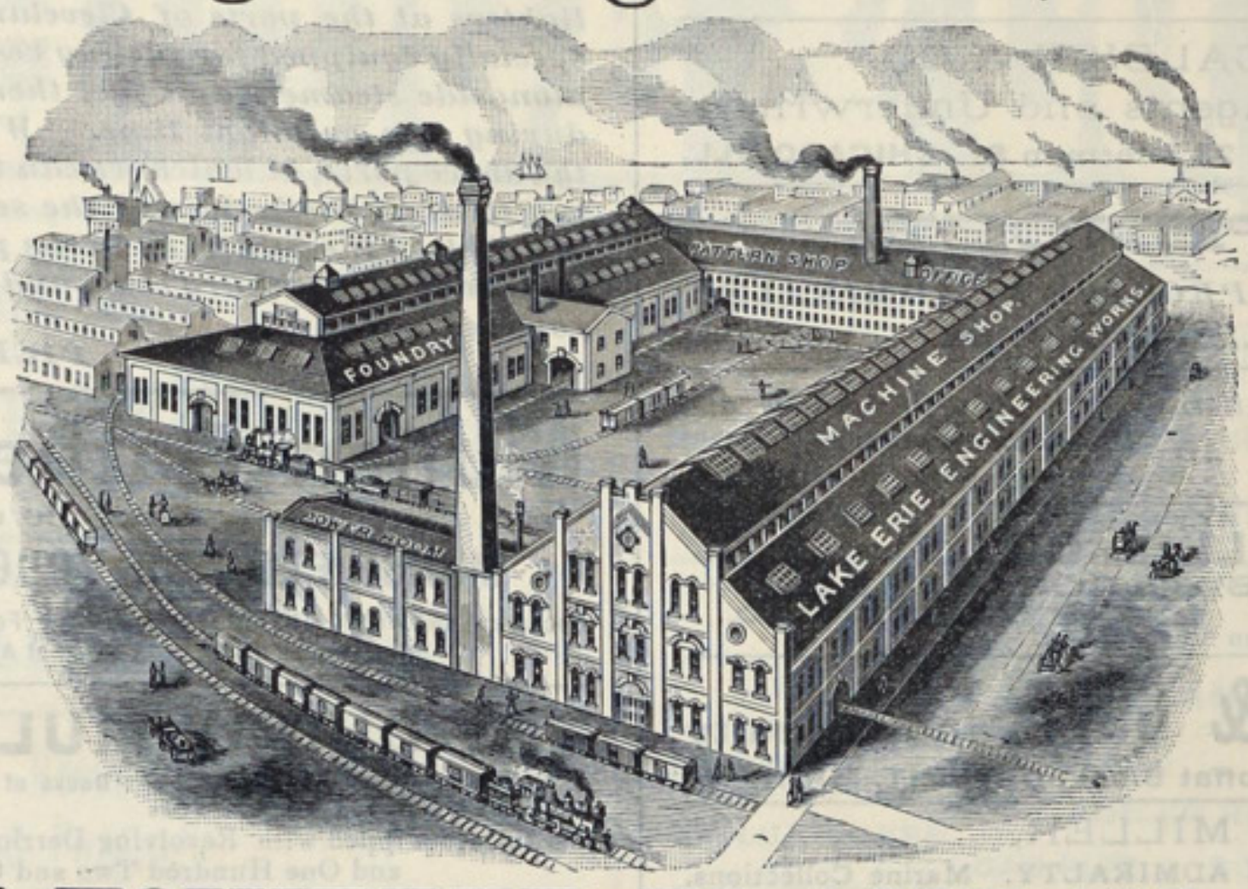

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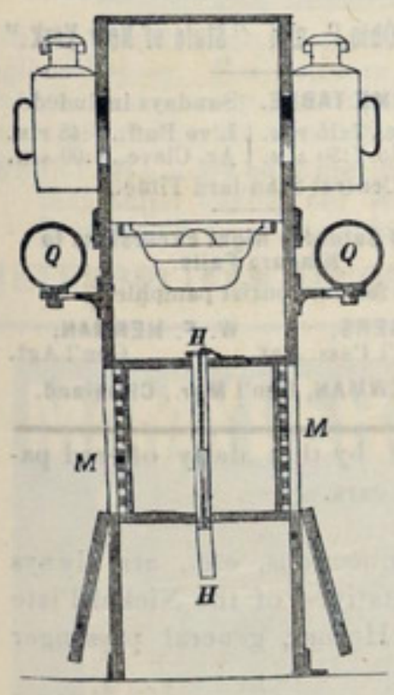

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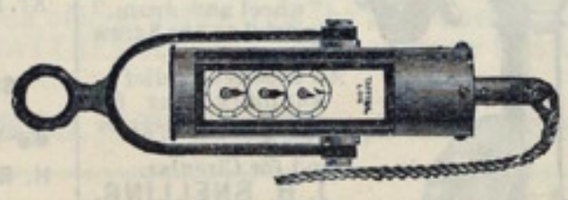

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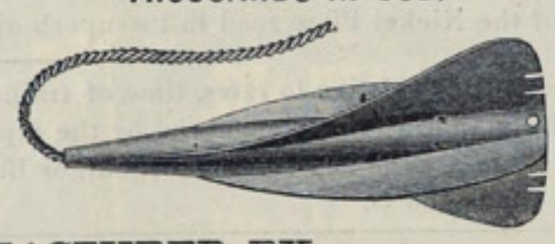

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